MARINE REVIEW.

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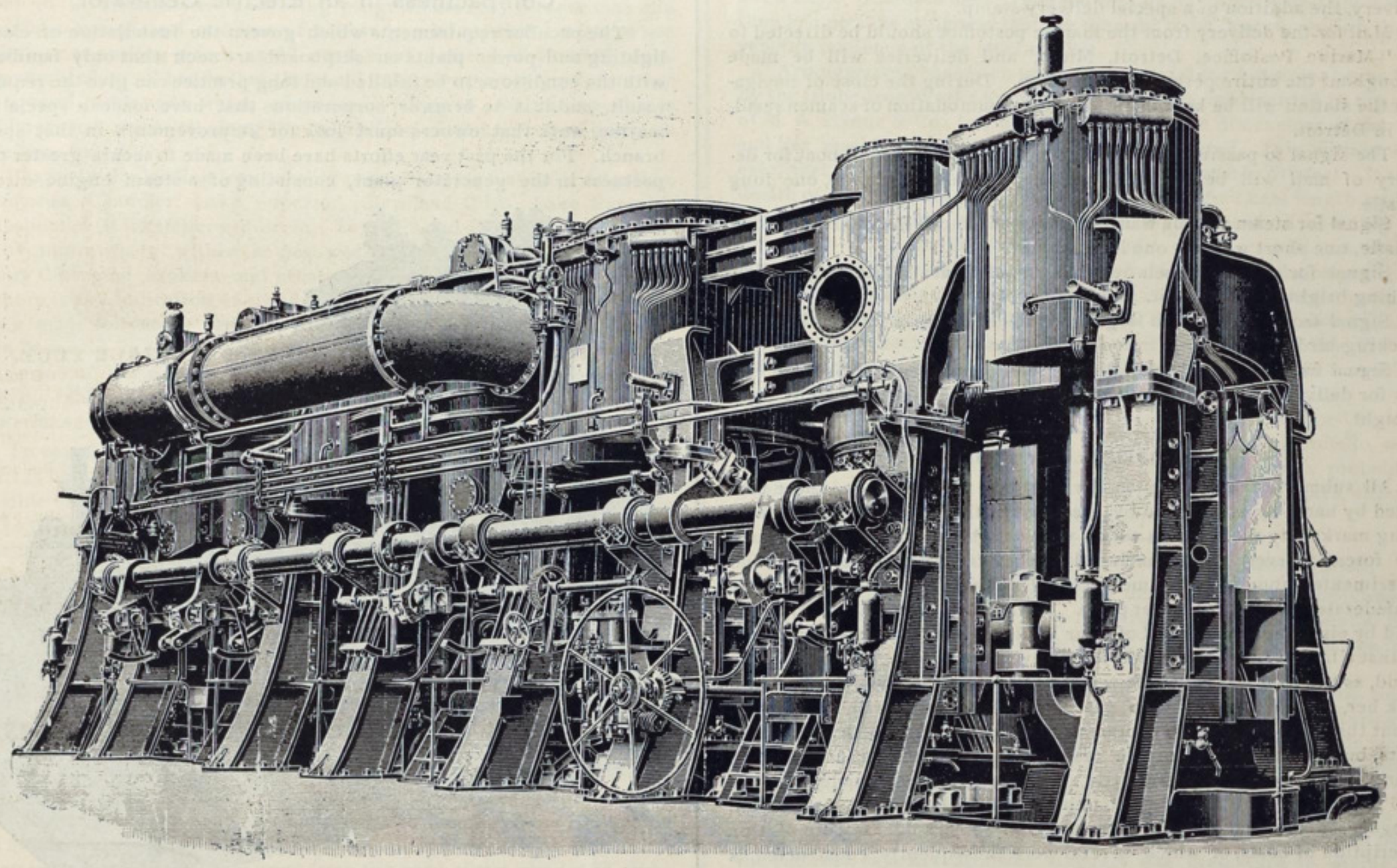
One of England's Commerce Destroyers.

In the last issue of the REVIEW, page 8, a description is given of the engines and boilers of the Terrible, the biggest and most powerful cruiser ever built for any nation. An engraving showing one of the twin triple expansion engines of this ship is presented herewith. This is one of the two vessels to which the admiralty has applied Belleville boilers, thus encountering the strongest kind of opposition and adverse criticism from ship builders throughout Great Britain. The Terrible represents a new departure in the British navy, being built on the lines of the large Atlantic liners, very much after the Paris and New York. Extended reference is made to engines and boilers in the last issue, but a short general description of the ship will be interesting in connection with the engravings.

The Terrible was built at J. & G. Thomson's yard near Glasgow and is 500 feet between perpendiculars, 538 feet over all and 71 feet wide. She is designed to have a draft of 27 feet and to be of 14,200 tons displacement.



ENGINES OF THE BRITISH COMMERCE DESTROYER TERRIBLE.

Engines are of the four cylinder triple expansion type. Each of the two sets is designed to develop 12,500 indicated horse power. Steam is supplied by forty-eight water tube boilers. The safety valves on the boilers are loaded to a pressure of 260 pounds per square inch, this pressure being reduced to 210 pounds at the engines by means of a patent reducing valve placed at the forward end of each engine room. Each set of engines is placed in a separate engine room by a longitudinal water-tight bulkhead which extends the whole length of the machinery space, and each engine room is in all respects exactly similar and entirely independent of the other. The diameters of the high and intermediate pressure cylinders are 45 inches and 70 inches respectively, while the diameter of each of the low pressure cylinders is 76 inches, all having a stroke of 4 feet. The high pressure cylinders are placed forward, and are each fitted with piston valves of the inside type, having improved adjustable packing rings, while the intermediate and low pressure cylinders are fitted with treble-ported flat slide-valves on their sides, having a special type of relief frame to relieve them of steam pressure, and the weight of all the valves is suitably balanced in order to reduce the strain on the valve gear as far as possible. The engraving is taken from Engineering of London.

Reaching the Maximum of Canal Capacity.

With vessels subjected to delays of twelve hours and more at the St. Mary's Falls canal, and with little prospect now of the Canadian canal offering any material relief this season to the enormous increase in the fleet of deep-draft vessels engaged in Lake Superior commerce, it is quite probable that the Lake Carriers' Association will soon be forced to take up with General Poe the question of endeavoring to provide, through action on the part of the war department, means of hurrying work on the big 800-foot lock. Members of the association are already urging this matter with some of the officers. Delays at the canal during the past week have, of course, been caused in a large measure by the Lake Superior fleet becoming bunched, on account of so many of the vessels running up light, and this difficulty will be partly overcome when more coal is being moved. But everything points to a greater increase in the canal traffic this season than has ever before been recorded, and there is no telling what proportions will be reached in Lake Superior commerce next season, in event of permanency attending the present improvement in business. Yet General Poe is quoted as saying, upon his return from Sault Ste. Marie a few days ago, that the new lock and approaches, the latter involving 142,000 cubic feet of dredging and the building of 2,925 linear feet of piers, will not be completed until the spring of 1897. Unless there is to be a certainty of relief from the Canadian canal next season, it is not surprising that there is some anxiety among vessel owners regarding this delay of practically two seasons before the new American lock is in readiness to receive vessels.

It is more than probable that everything that can be done is being done at the canal to hurry the locking of vessels. Some time ago it was figured that one boat might be locked through the canal every fifteen minutes, or ninety-six in twenty-four hours, but on Tuesday of last week a record of 109 boats was reached, so that the maximum must be near at hand.

Col. Jared A. Smith, United States engineer of Cleveland, says that Gen. Craighill, chief of engineers, will probably visit Cleveland during the summer and inspect some of the government work at Ohio ports.

Detroit River Postal Service.

The Detroit river marine postal service was inaugurated on Wednesday of this week in a manner indicating the determination of the department to at least give the undertaking a thorough trial. As had been expected, a large number of masters were found unwilling to check down their vessels, probably from a lack of knowledge of the government being in charge of the work, and probably from the fact that they expected no mail of importance and were unwilling to sacrifice even the little time involved in checking. The service must be given a few weeks of trial before anything definite can be said of its merits.

In announcing the establishment of the branch office for this service in Detroit, Postmaster Enright of that city says that the success of the service will depend, in a large measure, on the co-operation of the vessel interests. He promises an efficient service if vessels will check down to receive or deliver mail and directs attention to the following regulations and code of signals:

It will be necessary for the boats desiring to receive or deliver United States mail to enter the American channel, but only at the point of delivery.

The station will be located near the ferry landing between Woodward avenue and Bates street, and deliveries will be made as nearly opposite that point as possible by a launch and small boats, the service being a continuous one day and night.

The delivery of telegrams may be had by instructing the telegraph company to attach a two-cent stamp to the telegram, and, for immediate delivery, the addition of a special delivery stamp.

Mail for the delivery from the marine postoffice should be directed to the "Marine Postoffice, Detroit, Mich.," and deliveries will be made throughout the entire period of navigation. During the close of navigation the station will be kept open for the accommodation of seamen residing in Detroit.

The signal to passing boats from the United States mail boat for delivery of mail will be one long whistle, one short whistle, one long whistle.

Signal for steam vessels wanting mail boat to call for mail: One long whistle, one short whistle, one long whistle.

Signal for sailing vessels requiring mail boat: White flag by day, flashing bright light at night.

Signal from mail boat to large boats to check down: Three blasts of mocking-bird whistle.

Signal from row boat belonging to mail boat when approaching vessels for delivery of mail: White flag in day time, swinging bright light at night.

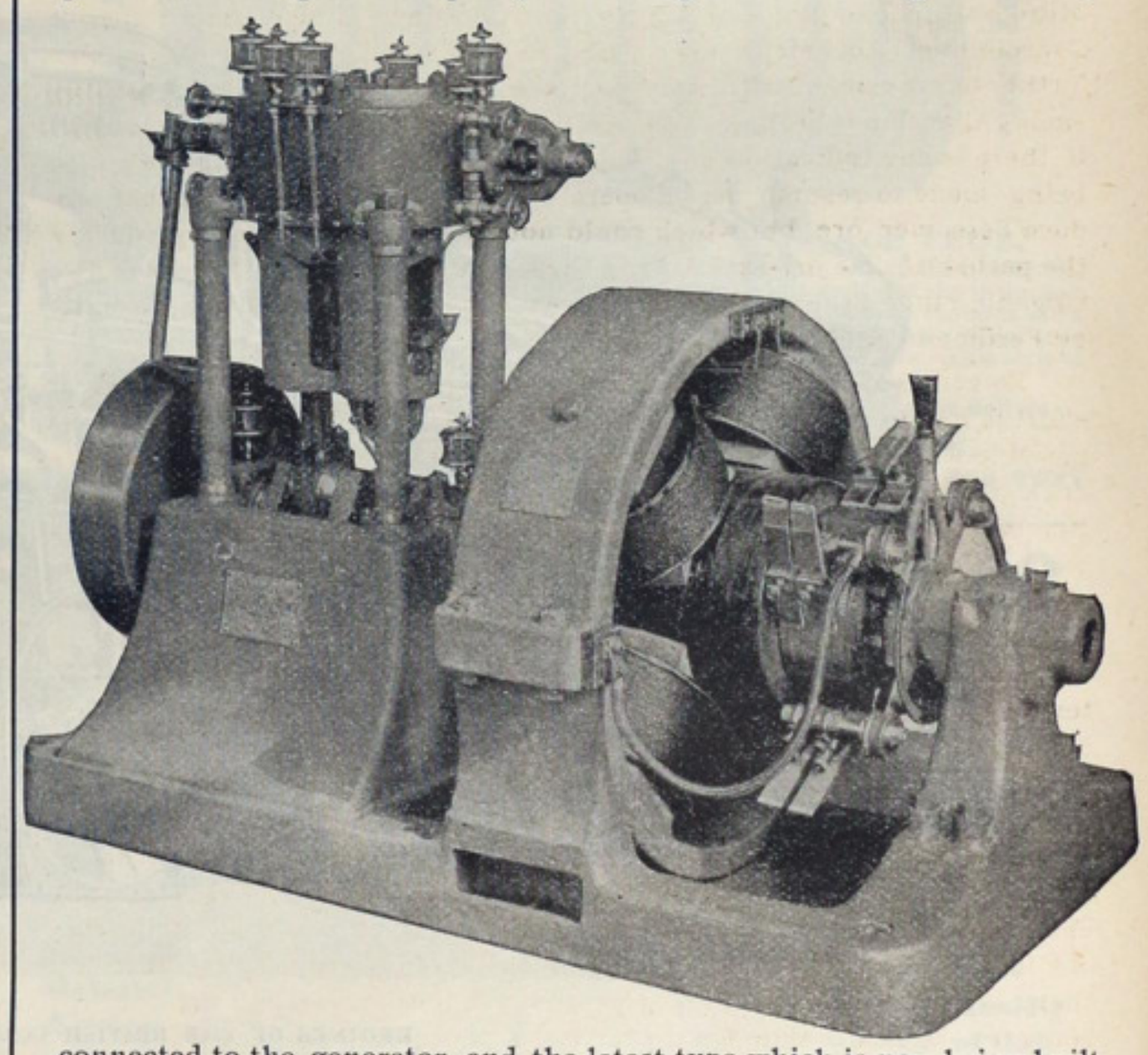
Submarine Navigation.

All submarine boats may be divided into three classes—those propelled by hand, by steam, and by electricity, their priority and success being marked by the order in which we have placed their respective motive forces. Several boats included in the first category were built and experimented upon in both America and England, and during the war the Confederates built one of boiler plate. It was of the cigar shape, driven by hand by eight men at a speed of four knots an hour, and was employed against a blockading squadron. After several unsuccessful attempts, the David, as the boat was called, fastened onto one of the enemy's ships and sank her, but being unable to get clear went down with her victim. About this time the French commenced experimenting with submarine boats, but no especial favorable results appear to have attended their efforts. For some few years little or no progress was made, until in 1886 Nordenfelt built a boat at Stockholm, which belongs to our second category, as she was driven by steam. One remarkable feature of this description of boats, of which several were subsequently constructed, is their comparatively great size. The largest we believe, was built and tried some eight years ago, and was 125 feet in length, 12 feet in diameter, of 1,000 horse power and with a displacement of 230 tons and a speed of 15 knots when afloat on the surface of the waves. It is instructive to notice a feature common to all submarine vessels, and that is the enormous difference which exists between the speed when the boat is on the surface and when she is simply immersed, that is with her top lines barely above water. A speed of 15 knots under the former conditions becomes reduced to a third of that amount when the latter obtain. This low speed, which at the present day does not exceed 7 or 8 knots in the electrical submarine boats, is a serious drawback to their usefulness, especially as they are intended solely for purposes of war. It would, indeed, be difficult to find any other role for which they are suited. They would be useless in times of peace, except perhaps for the carriage in stormy weather, of private and secret dispatches.

The French claim, and we are inclined to think with some justice, to have been foremost in experiments, investigations, and in the whole study of the theoretical and practical sides of the question of sub-marine navigation. They put forward as model boats, and as examples for imitation to other nations, the Goubet, Gymnote, and Zede. All these boats, as well as the English Waddington and the American Baker, belong to our third category, and are consequently driven by electricity, as are all the modern craft which have literally to go down into the sea. Their motive force is supplied by accumulators, the weight of which is very unfortunately greatly in excess of their proportionate capacity, so that the necessity for constantly recharging them forbids the attempt at any distance at all approaching a long voyage. From 100 to 120 miles is the very most that could be expected from vessels of the dimensions of those we have quoted. It is stated that engineers at present can not reckon upon more than four amperes to one pound of accumulator weight, but that experiments recently carried out seem to indicate that this output can be doubled. The shape of submarine boats varies considerably, both longitudinally and vertically. The Waddington is built on the well-known cigar model, and has a length of 37 feet and a diameter amidship of 6 feet, An oval-shaped transverse section is given to the Baker, 8 feet in height and 9 feet in beam, and a length of 40 feet, and when floating in the water on an even keel has a strong resemblance to a perch, with its periscope for a diminutive back fin. One point of difference between the American and English boats is that the former is provided with a small steam engine, which can be used either to work the propelling screws or to drive a dynamo to recharge the accumulators. This last named operation is one of considerable importance, and will probably play a prominent part in the future development of submarine navigation, should it be destined to extend its present limited sphere of action.—The Engineer, London.

Compactness in an Electric Generator.

The peculiar requirements which govern the installation of electric lighting and power plants on shipboard are such that only familiarity with the conditions to be fulfilled and long practice can give the requisite result, and it is to firms or corporations that have made a specialty of marine work that owners must look for improvements in that special branch. For the past year efforts have been made to secure greater compactness in the generator plant, consisting of a steam engine directly



connected to the generator, and the latest type which is now being built by the General Electric Company is an instance of success in this direction.

The combination shown in the illustration consists of a double cylinder vertical engine, 4½ by 4 inches, directly coupled to a general electric multipolar generator. It is known as an eight-kilowatt set, the voltage of the dynamo being 110 volts. In the generator, which is of the latest type, all the material of the frame is available for magnetic purposes, so that the magnetic leakage is reduced to a minimum—a point of vital importance on board ship. The frame is of cast soft steel of very high magnetic permeability, and the armature is iron-clad, i. e., the windings are sunk in slots in the outer surface of the armature core, are interchangeable and can be easily replaced. Provision is made to ventilate the armature thoroughly, and the insulation throughout is practically indestructible. The commutator and brushes work perfectly under all conditions of load, and the regulation has been brought to a high degree of excellence.

This generating set occupies a minimum of floor space, and this consideration alone will serve to reccommend it to ship builders and owners. It runs smoothly, and is very small for its capacity.

Official Ore Shipments—Heavy Production.

Official figures covering the ore movement from all shipping ports to June 1 have been received by the Cleveland Ore Shippers' Association. Shipments by ports are not given out, on account of the objection from the railway managers who furnish the figures, but the aggregate from all ports—Two Harbors, Duluth, Ashland, Marquette, Escanaba and Gladstone—to June 1, 1895, is 1,447,329 gross tons, against 1,208,469 gross tons on the same date in 1894, or a gain of 238,860 gross tons. It is, of course, well known that the ore movement, which has upheld all branches of the lake trade since the opening of navigation, has been very heavy, and is now even heavier than it was during May, but it was hardly expected that there would be any material increase on June 1 of this year over the same period in 1894, as shipments were made during the latter part of April in 1894, and there was no movement of ore this year until the first week in May.

These figures have caused ore dealers to admit now that it is quite probable that the eight-million mark will be exceeded in the season's output of ore of all kinds, but extra shipments will be due not as much to the Bessemer output, upon which there was a settlement before the season opened, as to the increased movement in ores of lower grades that are being brought down on the strength of improvement in the iron industry, which has already surprised all expectations. The ore dealers, who took the initiative last winter and announced that they would not sell their ore unless they could have an advance that would admit of something of a profit in the business, are now being congratulated by furnace men and manufacturers of steel and iron of all kinds, who say that a mistake was made in not putting prices up 50 cents a ton instead of 15 to 25 cents. It is admitted on all hands that the stand taken by the ore producers was the ground work upon which advances in values of iron mining shares and improved prices all along the whole line of iron and steel products have been based.

Shares in the leading iron mining properties, such as Lake Angeline, Minnesota, Chandler, Lake Superior, Cleveland-Cliffs, Lake Superior Consolidated (Rockefeller syndicate), Republic and others have all shown further improvement within the past week or ten days, with some trading among Cleveland brokers, and prospects of an active market for stocks if there is any indication of dividends later on. Preparations are also being made to resume active operations at a few small mines that produce Bessemer ore, but which could not be worked to advantage during the period of low prices. Among these are the Anvil and Windsor, two Gogebic range properties which are said to have been acquired recently by Ferdinand Schlesinger.

To vessel owners, as well as ore shippers, it is evident that a great effort is being made by everybody concerned to move as much ore as possible while there is any chance for direct shipments from Lake Erie docks to furnaces. Conditions have been especially favorable up to this time for heavy shipments to furnaces, on account of the light coal movement, but now that soft coal mines in both Ohio and Pennsylvania have all resumed operations, cars are becoming scarce, thus early in the season. The lake freight problem will therefore become complicated, both in coal and ore, but indications are nevertheless favorable to the vessel interests. On the strength of the ore movement alone, which after all has amounted to less than 1,500,000 tons in May, and must average about 1,250,000 per month for the balance of the season, freights have been maintained at advances over contract rates. Shipments of coal, which are now as active as the car supply will permit, may be expected to be fully compensative for any falling off from the heavy movement of ore during May and the early part of June, and there is, on this account, certainly no indication of a falling off in freights. Shippers have taken where they could secure them, vessels for two or three trips from the head of the lakes at 85 cents, and a few days ago tonnage to carry 75,000 tons of ore from Escanaba was placed at 55 cents. These transactions indicate the feeling in the market. Ore rates are now very strong at 85 cents from Duluth, Two Harbors and Ashland, 75 cents from Marquette and 55 cents from Escanaba.

More Charts of the Several Lakes.

The United States hydrographic office is now engaged in publishing general charts of the lakes. These charts are not made from naval surveys, but are prepared from various sources of information, and it is probably on this account, and for the purpose of warding off criticism from the engineer corps of the army, that the following notice is sent to the REVIEW for publication:

"The hydrographic office always endeavors, as far as possible, to give credit where credit is due, and in all its publications it cites all the authorities from which information is drawn for compilation and construction. On charts, however, which are made up from many authorities, it is customary to state no more than that the chart was compiled from the latest authorities. This usage has been followed in the new charts of the great lakes just issued from the hodrographic office, among which are the charts of Lake Superior, Lake Michigan, Lake Huron and Georgian Bay, and Lakes Erie and Ontario. It is stated, first that they are compiled, and second that they are compiled from the latest information. The hydrographic office desires to give the following list of authorities from which the information for the above named charts has been taken:

"First—Admiralty charts resulting from the surveys made under the direction of the government of the Dominion of Canada, by Commander Boulton, R. N.

"Second—The surveys in the Province of Ontario by the department of crown lands; published in 1887.

"Third—Various surveys by the department of public works of Canada.

"Fourth—The charts resulting from the survey of the United States waters of the great lakes by the corps of engineers, United States army.

"Fifth—The publications of the light-house establishments of the United States and Canada.

"Sixth—The United States land office maps of the state of Michigan; published in 1886.

"Seventh—The United States geological survey maps."

Contracts for New Ships.

As a result of the general improvement in lake business, considerable figuring between vessel owners and ship builders has been going on during the past two weeks, and three contracts for new steel freight steamers are announced with prospects of one or two more coming to light within a few days. Builders have urged matters by buying material upon which they had options at figures that are thought to be low in view of the advancing tendency of the steel market.

Arrangements have been made for material for a steamer to be built by the Globe Iron Works Company for interests represented in the office of M. A. Hanna & Co., but details regarding the dimensions of the ship and her machinery have not as yet been completed. It is certain, however, that the boat will be of 400 feet keel and probably 412 feet. It is the desire of the builders to make the boat of 412 feet keel length and put 200 to 250 tons more material into her than is used in most 400-foot steamers. Although this boat will be built to replace the lost steamer Norman in the office of M. A. Hanna & Co., she will not be owned by the Menominee Transit Company, that corporation, as at present constituted, not having its affairs suitably arranged for the building of new ships.

The announcement that F. W. Wheeler & Co. of West Bay City will shortly put down keels for two big steel freight steamers is correct. A contract for one of the boats has been closed with the Whitneys of Detroit, and it is quite probable that the second one will be owned by Capt. John Mitchell of Cleveland and the Gratwick interests of Buffallo, which he represents. The Whitney boat will be high-powered, probably so much so that she will be the fastest freight boat on the lakes, although not as large as some that are now being put down.

Cause for the Delay with the Canadian Canal.

In seeking information regarding delay in opening the Canadian canal, a letter of inquiry was also forwarded to a correspondent at Sault Ste Marie, Ont., who makes the following answer additional to the letter appearing on another page:

"The true cause for delay in opening the new canal on this side of the river is undoubtedly concealed. One excuse given for not having the approach from the upper end completed at this time is that the ice last winter, in drifting down, brought with it large boulders and rocks, which accumulated in the excavated channel, and must now be dredged out. This theory is not regarded as a very sound one by those familiar with the currents, the ice and the location. The latest issue of the local paper, the Express, says that Minister Haggart was premature in giving out invitations recently for the opening ceremony which failed to materialize, and adds that if the canal is open for traffic by Sept. 1, judging from present appearances, those interested in the work will be doing well."

"If the facts were known it would probably be found that in addition to the great amount of dredging still required in approaches, the engineers are having trouble in getting the lock chamber tight. It was found on trials that the leaks were so great that it was with great difficulty that the water in the lock chamber could be raised to the level of the approach above, a condition which is absolutely necessary in order to open the upper gates, as; if there was a difference of level between the gates, the pressure on the latter would be so great that they could not be opened."

A handsome and unique watch chain, wholly nautical in design and workmanship, is made by Morgan A. Robertson, 45 East Ninth street, New York. An advertisment on another page contains an engraving that gives a fair idea of what the chain is like. It is specially prepared for sale to marine men. A circular giving prices, etc., may be had by addressing Mr. Robertson.

REDUCED RATES TO ASBURY PARK.—The Nickel Plate road offers a rate of a fare and a third on the certificate plan July 8th to 13th, account national meeting League of American Wheelmen. 277 July 4

Important Points Regarding Lake Superior Ore.

Dispatches from Philadelphia, recently, made brief reference to a report to the United States Geological survey from John Birkinbine, the well known authority on mineral statistics, regarding the iron ore production of the United States. This report, or article as it may be called, is not yet in print, but will appear in a monograph treating of the iron ore supply of the world, which will make about 200 pages of the forthcoming volume of mineral resources, to be published by the Geological survey. In his part of this work Mr. Birkinbine refers at some length to the Lake Superior iron region. He has favored the REVIEW with a few of the proof sheets, and although the information which they contain is not new in this part of the country, the following extracts are printed on account of the points of interest which they bring out:

"The percentage of the total ore output of the country, which came from the Lake Superior region were: 51 in 1889, 56 in 1890, 53 in 1891, 59 in 1892, and 57 in 1893. While the Lake Superior region is to be credited with more than one-half of the total iron ore tonnage of the country, the quality of the ore from its mines is also above the average of domestic ores mined, thus adding to the commercial importance of this region. It is estimated that the iron ores extracted in this region during the period 1889 to 1893 made from 55 to 63 per cent. of the pig iron produced in the country in that period, provided all the ore mined from this district was smelted in the year it was produced, no account of stocks of ore on hand being taken into consideration.

"The distance between these mines and the majority of blast furnaces using their product demands that only the richer ores be shipped; consequently, deposits furnishing high-grade ores which could supply in addition liberal amounts of leaner red and brown hematites, and apparently extensive veins of magnetite of inferior grade, are unwrought, or if they have been worked, are not now exploited except for the betters ores.

"In no other part of the country, and probably nowhere in the world, is iron ore mining carried on in a more thorough manner than in the Lake Superior district. The hoisting and pumping machinery and the compressor plants are generally of the most approved design. Power drills and high explosives are utilized to break the mineral economically. Electricity is introduced for lighting and for traction underground, and air compressed by water power machinery is conveyed miles to work hoists, pumps, drills, etc. Mine timbering and shaft sinking have received careful attention, and the steam shovel is employed to dig ore in the open cuts or to load it on cars from stock piles.

"The shipping appliances have been a most important feature in permitting the ore from the Lake Superior region to reach distant points of consumption. Millions of dollars have been expended on shipping docks, and millions more on receiving docks and railroad terminals. Other millions still have been devoted to building and equipping magnificent steam vessels of large capacity.

"While the transfer of ore to cars at the mines, from cars to pockets in the shipping docks, from pockets to the holds of vessels, from vessels to stock piles on receiving docks, and from piles to cars, and from cars to furnace, stock houses, or stock piles adds to the cost of the Lake Superior ore, the expense of these rehandlings has been so reduced as to permit ores from Minnesota, Wisconsin, and Michigan to compete with foreign ores close to the Atlantic seaboard, with a protective duty of but 40 cents per long ton favoring the domestic product. This rehandling is, however, of advantage in equalizing the ore coming from a given mine, and it is probable that this thorough admixture is responsible, at least in part, for the regularity of composition shown by many of the ores taken from the larger mines."

Obstructions, Changes in Lights, etc.,

Until further notice the wreck of the schooner Kate Kelley, off Wind point (Racine point) light station, Wis., will be marked every night by a white light attached to a spar projecting from the wreck.

About June 22, the fog signal at Grand Haven light station will be moved and reestablished, without change of characteristic, in the fog-signal building recently removed and re-erected on the south pier at a point about 95 feet from its outer end, and immediately in rear of the pierhead light tower, entrance to the harbor.

The range lights heretofore maintained on the west side of the entrance to Owen Sound harbor, Georgian bay, have been abandoned and a new range established on the east side to the entrance. The back tower of the old range has been removed and now serves as the front tower of the new range. The front tower of the old range, on a crib outside the entrance, is still standing but is not lighted; it marks the point where vessels should leave the alignment of the new range and head for the entrance midway between the breakwater piers. It is proposed to remove this pier and building in connection with dredging now being prosecuted. The new front range light tower stands on a pile foundation at the outermost angle of the sheet piling on the east side of the mouth of the river. The light is a fixed red, elevated 39 feet above the level of the water. It should be visible seven miles in, and over a small arc on each side of, the line of range. The back range light tower is located on a pile foundatian 915 feet S. by W. ¾ W. from the front tower, or 225 feet northeastwardly from the N. E. corner of the Canadian Pacific railway elevator. The light is a fixed white, elevated 46 feet above the level of the water, and should be visible eight miles in, and over a small arc on each side of, the line of range. After July 1 this light will be changed to a red light. The old range of lights led over the shoal off Squaw point, and consequently could not be used until close into the mouth of the river. The present alignment is farther to the westward than the old one and leads toward the west shore of the sound clear of all obstructions. It can therefore be picked up by vessels as soon as they enter the sound and the lights kept in line S. by W. ¾ W., until vessels are within 900 feet of the front tower, or opposite the site of the old front light, when they should bear for the middle of the channel, leaving the lights on the port hand in passing.

Vessel masters engaged in Lake Michigan ore trade will be interested in knowing that the third-class can buoy marking the shoal making out from Saunder's point, Gladstone, Mich., (Little Bay de Noquet) is reported as out of position. It will be replaced as soon as possible.

Big Dry Dock Pumping Plant.

About Sept. 1 the largest dry dock in this country will be completed at the Puget sound naval station. The pumping plant, which is being built by the Moran Bros. Co. of Seattle, Wash., has a capacity of 110,000 gallons per minute, measured while pumping from mean high water to the sill level. It comprises three centrifugal pumps for pumping out the dock, having separate engines all independent and one centrifugal drainage pump and engine. The pumps admit water on both sides of the disk. The wheels are 68 inches in diameter and the suction and discharge pipes are 42 inches in diameter. Each pump is driven by a vertical inverted direct acting engine, 28 inches diameter of piston by 24 inches stroke. Each pump and engine sit on a bed plate common to both, the engine being direct connected to the pump runner shaft. There are six boilers of the cylindrical horizontal return tubular type. Each is 6 feet in diameter, 16 feet long and contains eighty 4-inch tubes 16 feet long. The working pressure is 100 pounds.

Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store at the principal points of accumulation on the lakes on June 15, 1895:

	Wheat, bushels.	Corn, bushels.
Chicago	17,585,000	5,502,000
Duluth	9,014,000	.....
Milwaukee	328,000	.....
Detroit	342,000	149,000
Toledo	336,000	267,000
Buffalo	1,362,000	985,000
Total	28,967,000	6,903,000

Unique's Time.

Editor MARINE REVIEW: I am pleased to note that Mr. Westcott takes such an unequivocal stand on the subject of incog. letter writers. His thirst for manliness is also commendable and I am afraid insatiable. He ought to know better, however, than to cast such reflections on his own town. I can not get back at him, because Mr. Westcott was certainly never guilty of hiding his own light under a bushel. He rather allows it to shine at all times and in all its dazzling splendor. However, not to keep an anxious public in suspense, and in the hope that Mr. Westcott will now confound all those who have treasonably spoken a word in favor of the Unique with the deep damning evidence of their ignorance and gullibility, I beg humbly to subscribe myself, JOHN SMITH,

Marine City, June 17, 1895.

During the four and one-half years of its existence, there has probably been more new tonnage turned out from the ship yard of the American Steel Barge Co. at West Superior than from any other ship building plant in the country. Thirty-two vessls have been built at this yard within the time stated. Included in this number were a tug and three Standard Oil vessels. Twenty-eight of the vessels were whalebacks and the total carrying capacity of the vessel output, reckoning on the average depth of water at the Soo canal, is 75,000 tons

The Nickel Plate road has compiled a list of country homes along the south shore of Lake Erie, willing to accommodate summer boarders, and a copy will be mailed to any address by enclosing a stamp to any agent of the Nickel Plate road, or to B. F. Horner, general passenger agent. Aug. 31—265

A raft containing 6,500,000 feet of logs was towed down past Port Huron, a few days ago, by the tugs Proctor, Boynton and Parker.

Why Babcock & Wilcox Boilers were Removed from the Unique.

Upon learning that the two Babcock & Wilcox water tube boilers in the steamer Unique had been removed at Detroit, shortly after the unfortunate accident aboard that boat, and that boilers of a different make are to take their place, the REVIEW instituted an inquiry regarding the cause for this action. It is well known that the Babcock & Wilcox company is among the largest boiler manufacturing concerns in the world, and the management of the company in this country, as well as that of the English corporation known by the same name, has of late been giving special attention to a type of marine water tube boiler that has been developed after great research and a long line of experiments that could be conducted only by a big institution possessing experience, ample funds for such purposes and other advantages. It was strange then that this accident, the simple blowing out of a tube, should cause the boiler company to abandon its agreement to properly equip a small boat like the Unique with boilers. And explanation has been found through inquiry regarding the matter.

The Babcock & Wilcox company's contract with Mr. C. McElroy, owner of the Unique, when the boilers were put into the boat, stipulated that for every day the boat was delayed, due to the non-working of the boilers in any manner, the boiler company was to pay $50 demurrage. Immediately after the accident,one of the New York principals of the boiler company called on Mr. McElroy, Judge Moore and other owners of the Unique in Detroit, and after an examination of the space in which the boilers were placed in the boat, concluded that a mistake had been made in undertaking the contract under existing conditions. The manufacturers of the boilers decided that unless the deck of the boat above the boilers was cut out, and direct forced blast used underneath the grates, and provision made also to get rid of the closed stoke hold, it would be impossible for the boilers to give continuous satisfaction after the split tube was replaced. Consequently a proposition was made to Mr. McElroy to have the deck cut out and a deck house above the boilers built at the boiler company's expense; the boiler company also to furnish a new blower outfit to deliver the forced blast directly under the grates of the boilers, and to pay all damages that had been caused by the explosion on the boat. The owners of the boat took this into consideration, but on account of the loss of deck room they were unwilling to carry the boiler room up. Thus an agreement as regards alterations in the vessel could not be reached, and the boiler manufacturers elected to pay Mr. McElroy the $50 a day demurrage up to the time he believed he would get other boilers. It was on this basis the $9,500 settlement was made, the boiler manufacturers deciding that they could not properly work boilers in the space left for them by the peculiar design of the boat. Rather than take risk of losses in various ways, they withdrew and settled with the owners of the boat. It is well known that the Unique, built by her owners without a definite conclusion as to boilers, is of peculiar design, and the great object in putting machinery and boilers in the hold was to secure as much open deck space as was possible to accommodate the river passenger trade for which she was designed.

With this explanation of the cause for abandoning the effort to fit Babcock & Wilcox boilers to the Unique, it may be said that the accident —the blowing out of a tube—could not possibly be guarded against any further than the manufacturers had sought to avoid it by repeated tests that were placed upon the tubes before they were put into the boat. The boiler makers undoubtedly did everything in their power to make a safe job, and that the accident has had no influence upon the standing of the boiler is evidenced by the fact that the company has just closed a contract with the Plant Steamship Co. of New York for eight boilers for their new steamship to be built at Newport News, Va., the eight boilers to have a total heating surface of 20,300 square feet, with 460 square feet of grate surface, and to carry 250 pounds pressure. The boilers for the Zenith City, now building at the Chicago Ship Building Co.'s yard, are very nearly ready for the ship, and the test which the engineering department of the United States navy will make on these boilers will enable steamship owners on the lakes to judge of their qualities.

Tests of material for boilers of this type are very rigid. The forgings are tested at 600 pounds pressure as soon as completed and before the machining is done. The pressure is then dropped to 300 pounds and the forgings severely hammer-tested inch by inch. The forgings are then assembled with the tubes—which are two guages heavier than the regular standard and made of the best charcoal iron—and the sections tested to 600 pounds. When the boilers of the Unique were completed they were tested to 400 pounds at the works, and they were again tested to 400 pounds after they were erected in the boat, after which they were again subjected to a pressure of 375 pounds by the United States inspectors of steam vessels. In addition to this severe system of tests, the practice always is to drop a sizer through the tubes, in order to discover whether any of them, as received from the tube mill, are improperly welded. The splitting of a tube under pressure, which resulted so disastrously in the stokehold of this vessel, would probably have been attended by no serious results in an ordinary land plant.

Probably no Canadian Canal this Season.

A representative of one of the contracting firms at Sault Ste. Marie, who has had considerable to do with big engineering works on the St. Mary's river, writes the REVIEW as follows regarding the Canadian canal:

"I have visited the Canadian canal several times of late. I have talked with men connected with both lock work and dredging, and from all I can learn, and my own observation, I do not believe the approaches to the canal will be safe for deep-draft boats until late this fall, and there is even doubt as to whether they will be completed by that time. Of course this does not refer to small vessels or large ones of very light draft.

"Now it may appear, on account of the many unfavorable reports that have gone out about the Canadian canal, that the disposition on this side of the river is to speak of it at all times disparagingly, but you know I have no particular interest in either of the canals. It certainly seems strange that the final completion of the Canadian work is so long delayed, especially as it is understood that the lock was completed June 1, 1894, in consideration of a bonus of $90,000, and I am told that this bonus, which originally was to have been $100,000, has actually been paid to the contractors for the lock portion of the work. Still there is not a contractor on the work, nor an engineer connected with it, who can say anything definite as to when the canal will be ready for general commerce. The opening of the canal a few days ago was a mere formality. The government is not inclined to allow the canal to be used until the approaches above and below the lock are sufficiently dredged to be safe for large draft vessels, and right here I might say that the contractor who is dredging the approaches is known to be of the opinion himself that it will take all summer to finish cleaning up the approach at the upper end, or entrance from Lake Superior. I know that a tug, drawing 10 feet of water, on approaching the lock from the lower end, and while steaming some 40 feet inside of the buoy channel, struck a rock with only 7 feet of water over it.

"Some of the work of constructing the canal was so badly done, that repairs have been made this spring. The piers at the lower end have been recently built up and straightened into line to make them uniform, the whole thing evidently having settled or broken out of place where the repairs were necessary. When I was last at the canal, a few days ago, the lock was empty and workmen were engaged in screwing the gates up into place with turn buckles, they evidently having sagged."

No Boom in Improving Prices.

It is true that among a large portion of the business community, especially in the iron industry, considerable doubt exists as to the permanency of the present advance in prices. It is difficult to shake off the feeling of distrust that has existed among buyers for nearly three years past. In this connection the Iron Age in its last issue makes a very important point by comparing prices that ruled during the first week of June, 1893, and the last week of May this year. In the depression which followed the panic of June, 1893, prices went far below their then level, although at that time they had sunk so low as to break all previous records. It seems at least reasonable to suppose that prices might advance to their range at the time of the panic without being considered specially high. The table, which follows, fairly covers the leading iron and steel products:

	1893.	1895.
Bessemer pig, Pittsburgh	$13.50	$11.65
No. 2 foundry, Chicago	13.00	10.25
Steel billets, Pittsburgh	22.00	17.50
Common bars, carloads, Pittsburgh	1.45c.	1c.
Wire rods, Pittsburgh	29.00	25.00
Wire rails, carloads, Chicago	1.50	1.35
No. 1 forge scrap, Chicago	13.00	9.50

It will be seen that a good wide gap remains to be bridged until even the prices of June, 1893, are equaled or passed.

A steel steam yacht being built by the Cramps for David Dows, Jr., of New York was launched, a few days ago, and named Thespia. High speed is not expected of the boat. She is 174 feet on the water line, 195 feet over all, 23½ feet beam and 13 feet hold. She will have compound engines with cylinders of 22 and 42 inches diameter by 24 inches stroke, and two boilers 10 feet 9 inches long and 11 feet diameter. Williamson Bros'. steam steering engines will be used, and other auxiliary apparatus will also be of the best type.

Capt. John Palmer of Cleveland, writing H. G. Trout & Co. of Buffalo, says: "I herewith hand you check for wheel for steamer Geo. Presley. The wheel is entirely satisfactory. The steamer is towing this season two large vessels, the Nellie Redington and F. A. Georger, and is making about the same time that she did last season when towing only one vessel, and is consuming but little more fuel."

MARINE REVIEW

DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.

Published every Thursday at No. 516 Perry-Payne building, Cleveland, O

SUBSCRIPTION—$2.00 per year in advance. Single copies 10 cents each. Convenient binders sent, post paid, 75 cents. Advertising rates on application.

The books of the United States treasury department contain the names of 3,341 vessels, of 1,227,400.72 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons and over that amount on the lakes on June 30, 1894, was 359 and their aggregate gross tonnage 634,467.84; the number of vessels of this class owned in all other parts of the country on the same date was 316 and their tonnage 642,642.50, so that half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1894, was as follows:

Class.	Number.	Gross Tonnage.
Steam vessels	1,731	843,239.65
Sailing vessels	1,139	302,985.31
Canal boats	386	41,961.25
Barges	85	39,214.51
Total	3,341	1,227,400.72

The gross registered tonnage of vessels built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:

	Number.	Net Tonnage.
Year ending June 30, 1890	218	108,515.00
" " " 1891	204	111,856.45
" " " 1892	169	45,168.98
" " " 1893	175	99,271.24
" " " 1894	106	41,984.61
Total	872	406,976.28

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC.

(From Official Reports of Canal Officers.)

	St. Mary's Falls Canal.			SuezCanal.		
	1894.	1893.	1892.	1894.	1893.	1892.
No. vessel pass'ges	14,491	12,008	12,580	3,352	3,341	3,559
T'n'ge, net registd	13,110,366	9,849,754	10,647,203	8,039,106	7,659,068	7,712,028
Days of Navigat'n	234	219	223	365	365	365

Entered at Cleveland Post Office as Second-class Mail Matter.

ONE OF THE engineering publications of London, just at hand, draws attention to the facilities which have hitherto been afforded to foreigners for studying ship building and engineering in England and Scotland, and adds that the results have enabled the foreigners to return to their own countries as managers, etc., of kindred establishments and to compete with Great Britain so keenly that year after year her foreign trade in ship building becomes less and less. It is announced in this connection that of late private firms engaged on admiralty work have been requested by the admiralty to dispense with any foreign draughtsmen who may be in their employ, "as it has been found that they are apt to learn too much of what is going on; more especially as the advances made of late in the style of vessels being built are too important to have the particulars spread abroad." This action on the part of the admiralty is commended by certain ship building journals of Great Britain, on the claim that ship builders and engineers of that country have all along been too generous in their treatment of foreigners. What a bland admission of the gradual decline of British supremacy in ship building is contained in this order from the admiralty! Compare it with the broad spirit attending the dissemination of ship building information, and in fact all kinds of engineering news, in this country. But there is no such thing as hiding information of this kind. To endeavor to do so is to encourage a narrow policy of past ages.

LAKE VESSEL owners will make some money this year. Shippers admit that there will be no backward movement in freights, even during July and August. Ore shippers will endeavor to move ore throughout the season almost as rapidly as it is now moving, and the fact that coal shipments have been too long delayed is only now realized. Dollar ore is not only a possibility but a probability this year. Ninety cents is expected from the head of the lakes before the present month is at an end. These are opinions based upon interviews with several of the best-posted vessel owners of Cleveland who refuse to accept for even two or three trips in the summer period the rates now prevailing. In June a year ago vessel owners would have accepted 70 cents, if it was offered to them, on short contracts—two, three or four trips—that are now declined at 85 cents.

SEVENTY-FIVE per cent. of the business of Cleveland harbor in coal and ore is done in the old river bed. The project for radically widening the main river up to the Superior street viaduct would involve an expenditure of a vast sum of money and would not in the end result in as much benefit to the commercial interests of the port as half the amount expended immediately in improving the entrance to the old river bed and deepening the main channel up to the iron furnaces of the Cleveland Rolling Mill Company and the manufacturing property in the same vicinity. Vessel owners of the city are right in directing attention to these features of the harbor improvement question. They are most interested in the matter and their advice should be heeded by the municipal authorities and by the chamber of commerce.

IT WOULD SEEM that the difficulty and expense encountered in trying to find the sunken steamer Cayuga near the Straits would prompt vessel masters to carry a buoy apparatus of some kind on deck at all times. Underwriters have about given up hope of finding this valuable steamer. There would be practically no expense and little trouble attached to rigging up for all vessels a temporary buoy with line and weight, that would not only prove valuable in case of an accident like that which occurred to the Cayuga, but which might also be used to mark a new shoal or an obstruction of any kind encountered in the course of a season. Attention has repeatedly been called to this matter but vessel masters neglect it and do not realize its importance until a case like that at hand comes up.

A TABLE on page 11 of the last issue of the REVIEW, giving various details regarding hull, engines, cabin accommodations, etc., of the Northern line steamer North Land, included an item that would indicate that the boat had quarters for 211 steerage passengers. This was the case with the North West, the first boat, when she went into commission, but it is well known that no steerage passengers are now carried by either of the boats. Quarters for steerage passengers were done away with in the North West and there was no provision made for such passengers in the North Land, which has accommodation for 442 first class and twenty-two second class passengers. The immigrant trade of the company is now cared for by its six freight boats, each of which has accommodations for eighty.

SOME OF the stories that are being told of speed developed by the Northern Line passenger steamers North West and North Land are ridiculous. There is every reason to expect that the boats will make schedule time this season and do all that is required of them as 20-mile boats, attaining that speed later on in open lake when it is necessary to make up losses in the rivers, but it is well known that engines have not as yet been turned up in either of them to the speed at which it is expected they will make their best time. It is the opinion of the owners, as well as some of the principals of the Globe company, that the North Land will prove a little the faster of the two boats.

INTEREST in the subject of a deep-water connection between the lakes and the Atlantic seaboard will not down, especially among public-spirited men of the Northwest who have given time and labor to conventions and to work in one congress after another without recompense of any kind. At the meeting of the International Deep Waterway Association, to be held in Cleveland in September, some very valuable papers will be presented, notably one by Geo. Y. Wisner of Detroit. The executive board of this association, which was formed about a year ago in Toronto, will meet in Chicago on the 25th to make arrangements for the Cleveland meeting.

MANAGER NEWMAN of the Cleveland & Buffalo Transit Company was indiscreet enough to request some of the stockholders of the company to suggest a name for the big side-wheel steamer, and it is understood that a row at the christening can not now be avoided. "Jim" Brown of Buffalo is charged with putting up a job to have the boat named Grover Cleveland, and it is understood that the freight movement from the Buffalo end of the route has increased 50 per cent. since Agent Fisher was "jollied" with a promise that there is a possibility of naming her Queen City.

THE MERRITS of Mesaba iron range fame have secured a verdict in Minnesota for $940,000 against John D Rockefeller. It was probably not a very difficult task to have a home jury bring in a big verdict against a millionaire, but there are other courts to pass on such a verdict. The fact is that the Merritt mining properties would never have been developed without Mr. Rockefeller's money, and it is not probable that he is even now satisfied with the load he undertook when he went into the iron mining business upon the failure of early promoters of the Mesabi.

For the National Educational Association at Denver, Col., July 5th to 12th, the Nickel Plate road offers special low rates. A superb passenger service. Unexcelled dining cars. For information inquire of agents of the Nickel Plate road.

282 July 4

Around Lakes.

Capt. Wm. Mack of Cleveland, who was seriously ill, is recovering. Few men in the lake business have more friends than Capt. Mack.

McMorran & Co. of Port Huron have bought the burned steamer City of Concord from R. Bottsford of the same place and will rebuild her.

The Graham & Morton line steamer City of Louisville, now running between Chicago and St. Joseph, is the R. C. Reid rebuilt and enlarged.

Bids for removal of the wreck of the barge Ark, in the Detroit river near Amherstburg, will be received by the Dominion government up to June 23.

All machinery for the first of the Conneaut-Port Dover car ferries, building at Toledo, has been shipped to the boat by the Frontier Iron Works, Detroit.

L. P. & J. A. Smith of Cleveland have been accorded a contract for building range light structures at Sandusky. The work involves an expenditure of $16,987.

Arrangements are being made at the Wyandotte yard of the Detroit Dry Dock Company to lay the keel for the Cleveland & Buffalo Transit Company's big side-wheel steamer.

John Singleton, who has been connected with the Goodrich line of Chicago since 1871, has resigned as general passenger agent on account of ill health. He will be succeeded by H. A. Bonn.

The Penberthy Injector Co. of Detroit has again taken direct charge of the little sheet known as the Penberthy Bulletin and will issue it monthly. It will pay any engineer to ask for a copy, which will be mailed without charge.

Capt. Samuel Gibson, an old and well known shipbuilder of Buffalo, died a few days ago in that city at the age of sixty-six. In partnership with Robert Craig of Philadelphia, and others, he built the steamers Japan, China, India, Vanderbilt, and other well-known vessels. He retired from active life in 1887.

It was hardly expected when the Detroit Dry Dock Company completed its big dock at Orleans street a short time ago that enlargement would be talked of for eight or ten years, but the management is actually considering the matter of increasing the size of the dock, on account of the 400-foot steamers now being built at three lake ports.

Sounding boards are now talked of for several of the steam fog signals at lake ports. The light-house board has decided to place a wall of this kind back of the whistle in the Cleveland harbor, so that the sound will be thrown out toward the lake and not be so plainly heard in the city. The intervals between whistles will be lengthened, as was the case at Buffalo.

The Davidson steamer Rappahannock measures 2,380.80 tons gross and 1,911.37 net, and her number on the books of the treasury department is 111,083. Other new steam vessels on the lakes registered by the department last week are: John A. Stabel, Buffalo, 39.99 tons gross, 27.20 net, No. 77,182; Azalea, Detroit, 74.56 tons gross, 37.28 net, No. 107,168; Cheeman, Buffalo, 8.00 tons gross, 5.44 net, No. 127,081.

Mr. J. H. Wade's yacht Wadena of Cleveland is again in New York, after a voyage to Japan, where she cruised along the coast with her owners and friends aboard. The Wadena was just a year on the trip to Japan. She sailed from New York for Gibraltar June 16, 1894. From there she went to Malta, completing the run from New York to that port in seventeen days, having used 100 tons of coal. From Malta she went by way of the Suez canal to Yokahama. Mr. Wade and party had crossed to Japan by way of San Francisco.

S. F. Hodge & Co., Detroit, Mich., have moved their offices upstairs in their engine building plant on Atwater street, and the office force now occupies as fine a suit of rooms as are to be found in any of the engine works on the lakes. The secretary's office is stained green over natural wood and the president's room is large and handsomely furnished. On the door of the vault is a very neat painting of an anvil, which might be called the firm's coat of arms, as the founder of the business, the late S. F. Hodge, was a blacksmith by trade.

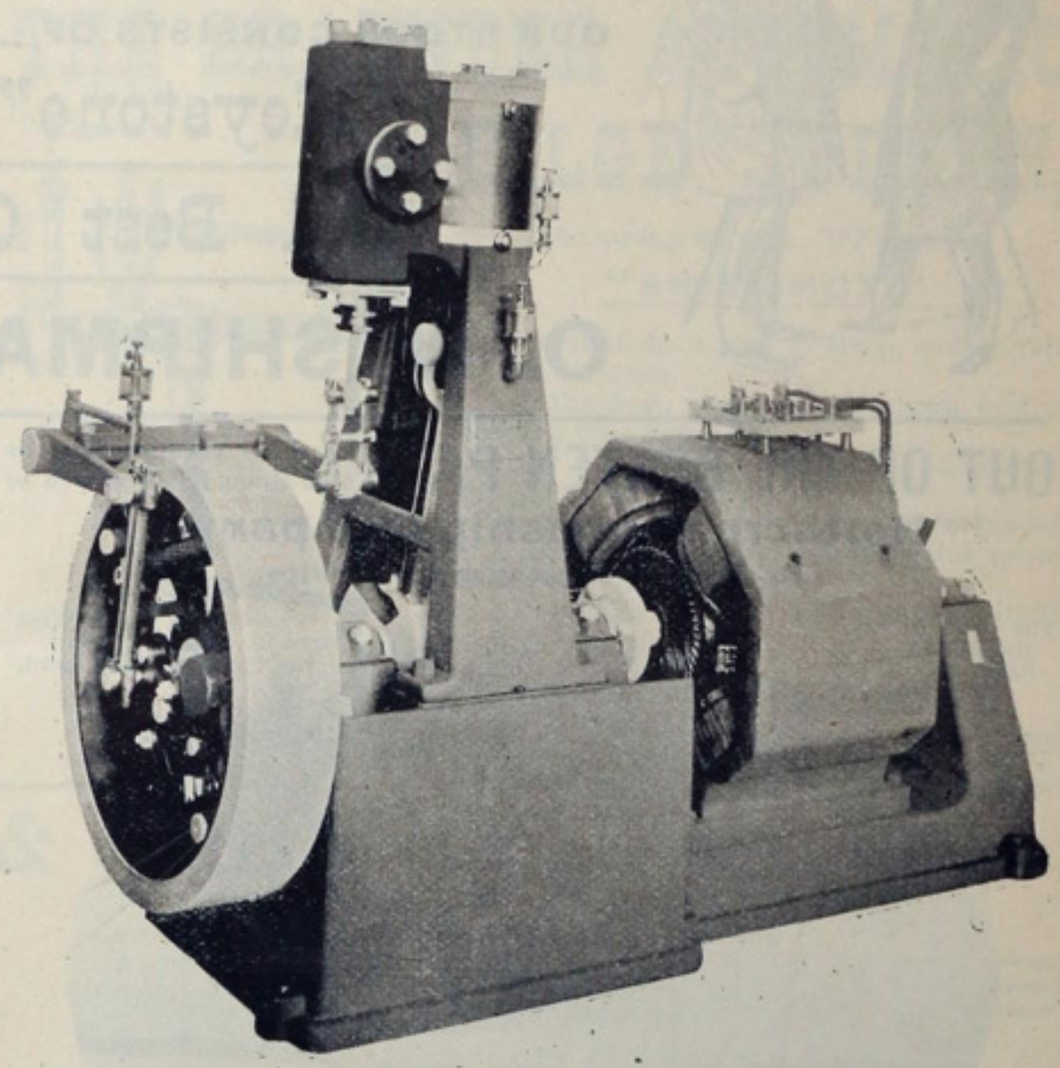
CAPTAINS AND MATES ARE INVITED TO CALL AT THE OFFICE OF THE MARINE REVIEW, AND LOOK OVER THE SAILING DIRECTIONS OF LAKES SUPERIOR, HURON AND MICHIGAN, PUBLISHED BY THE HYDROGRAPHIC OFFICE.

GO TO THE SEA SHORE—July 8th to 13th and attend the meeting of the League of American Wheelmen at Asbury Park, N. J. The Nickel Plate road has authorized a rate of a fare and a third on the certificate plan. 278 July 4

FOR THE GLORIOUS FOURTH.—The Nickel Plate road offers one fare for the round trip to all points on its line within a radius of 200 miles from starting point. Tickets on sale July 3rd and 4th, good returning until July 5th. 279 July 4

Electric Generating Machinery.

The direct connected engine and dynamo shown in the engraving on this page is of a new type made by the Fisher Electric Mnf'g Co. of Detroit. The steamers Victory and Zenith City building at South Chicago will each be supplied with two of these machines, and the Minnesota company's tow barges, also built in South Chicago, have one each. One



of these machines has also been adopted for the Graham & Morton Transportation Co's steamer City of Louisville.

It will be noticed that the bed-plate on which the engine is supported is very deep and very strong. The main journals are very large in diameter and of great length, and the same applies to the crank pin and also to the cross-head bearings. All the main journals on the engine and the dynamo are self-oiling. The machine is absolutely automatic in regulation and will operate under any pressure from 60 to 250 pounds. All the material used in the construction of these machines is of the very highest grade. The parts are interchangeable and the work of the best kind. The dynamo is of the multipolar type and represents the company's latest improvements. The armature is of the series wind type and the coils can be removed without disturbing the general wind of the machine.

In General.

Commander Ludlow, U. S. N., will be at the naval war college, Newport, R. I., during the greater part of the summer.

June 29 is the date fixed for the launch, at South Chicago, of the 400-foot freight steamer Victory, of which H. G. Dalton of the firm of Pickands, Mather & Co., Cleveland, will be managing owner. The other 400-foot boat building in South Chicago, the Zenith City, will not be launched until the latter part of July. These are the big ships that are to be alike in every respect excepting boilers, the Victory being fitted with Scotch and the Zenith City with Bacbock & Wilcox water tube boilers. Engines for both boats are being built by the Cleveland Ship Building Co. It is expected that both steamers will be in commission before Sept. 1, so that the navy department may have an opportuniy to make the tests contemplated on them this fall.

In all the time since the Cramps began work on the big American line ships St. Louis and St. Paul, no authentic information has been given out regarding engines or boilers of the vessels. It has been simply stated that they were fitted with quadruple expansion engines and Scotch boilers to develop 20,000 horse power. Both the Cramps and the International Navigation Co. have carefully guarded all details regarding machinery, but a letter from the office of the International company, just received by the REVIEW, gives cylinder sizes. There are in each ship two quadruple expansion engines having six cylinders each, the diameter of the two low pressure cylinders being 28½ inches, first intermediate 55 inches, second intermediate 77 inches and two low pressure 77 inches.

306—FOR SALE—6 by 8 inch deck engine, 8 by 4 by 10 inch boiler feed pump, 12 by 15 by 15 inch condenser.

307—WANTED—To buy a second-hand dredge and scow. Must be in good condition.

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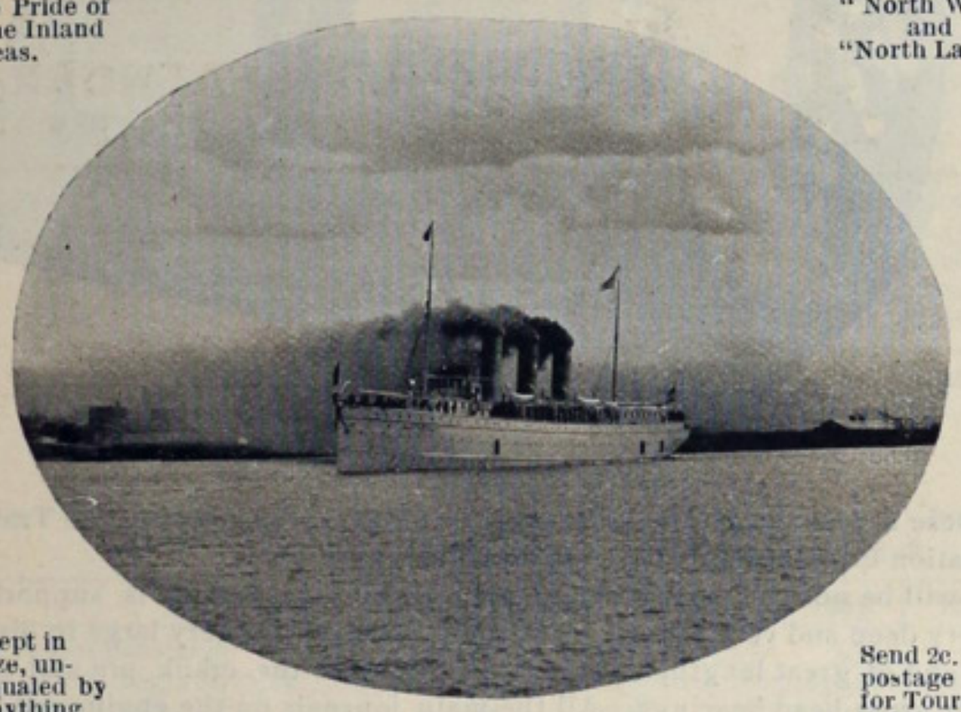

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Width:

On top, 95 feet,
Bottom, 55 "
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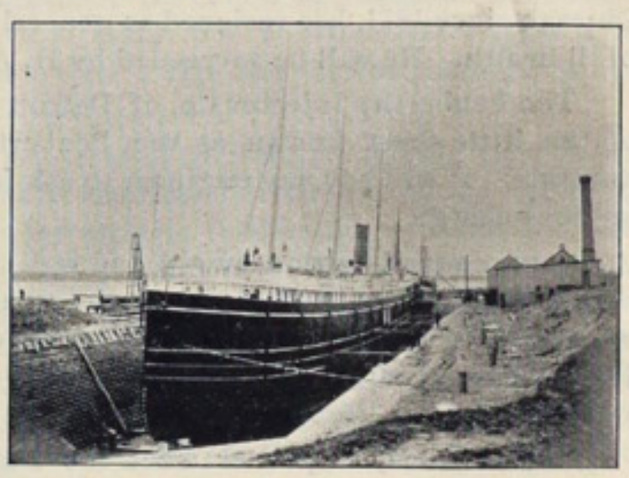
Depth:

To Floor, 20 ft.
To Sill, 18 ft.
On Blocks, 16 ft.



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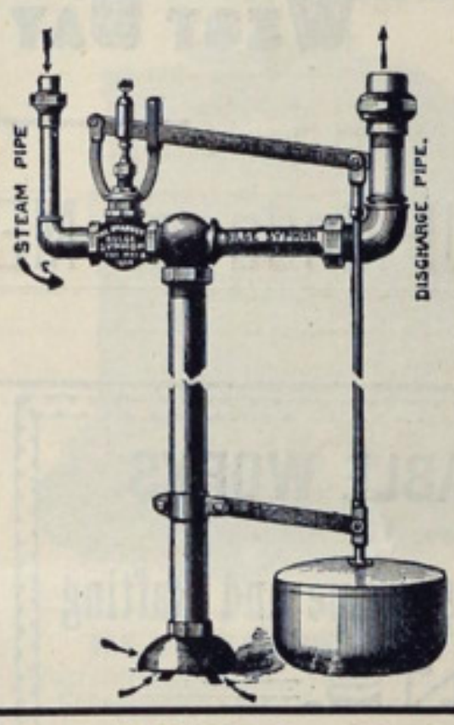

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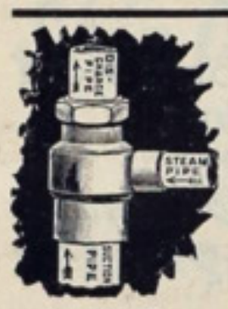

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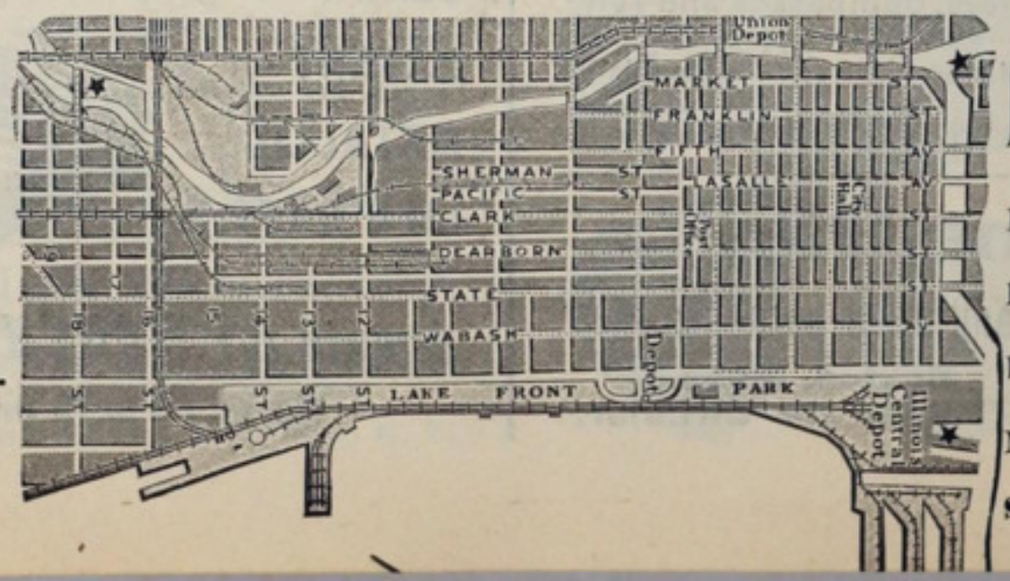

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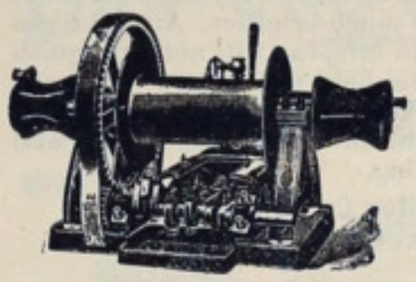

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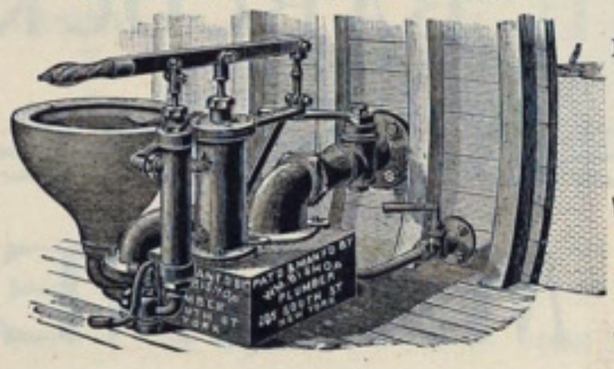

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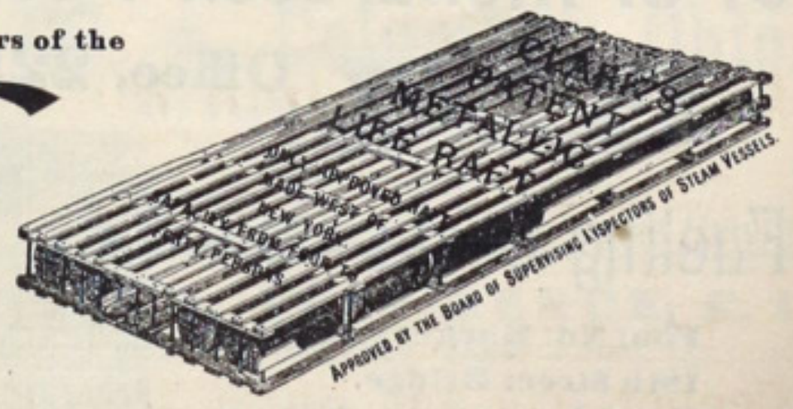

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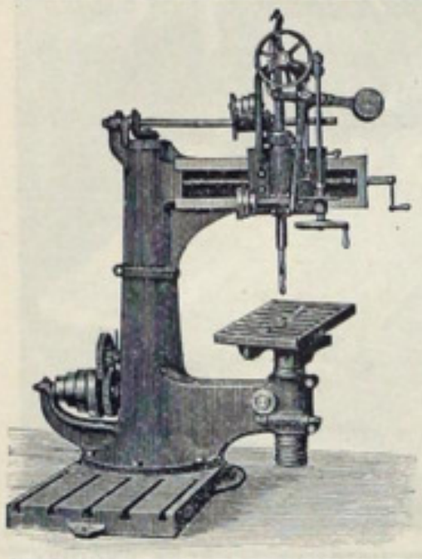

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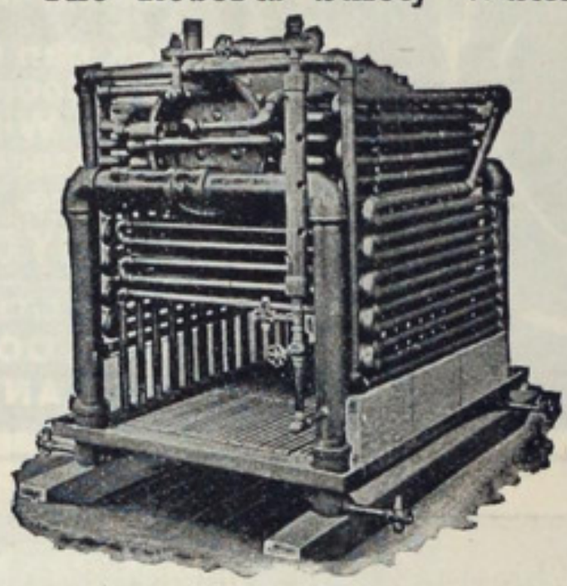

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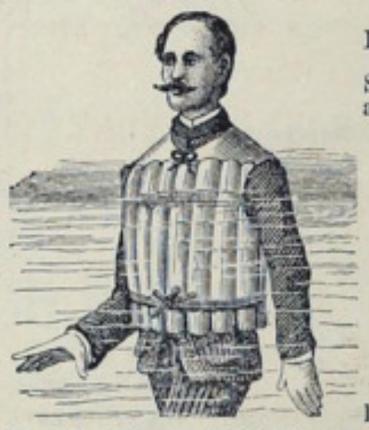

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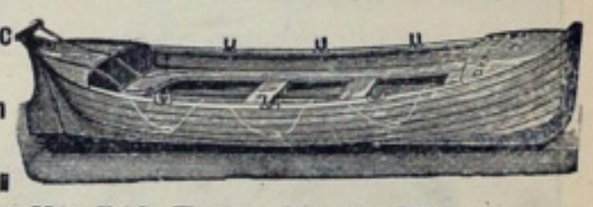

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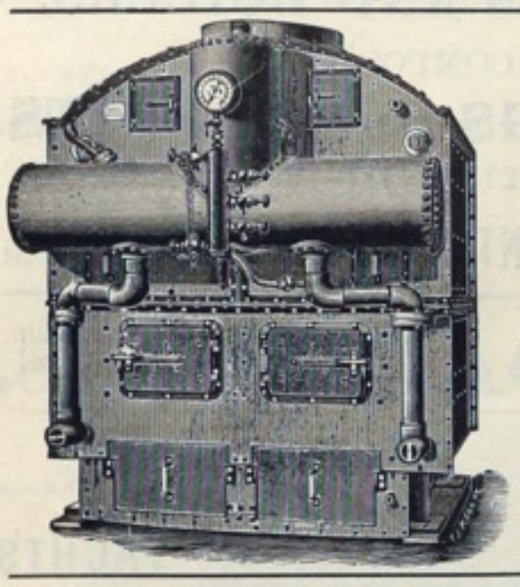

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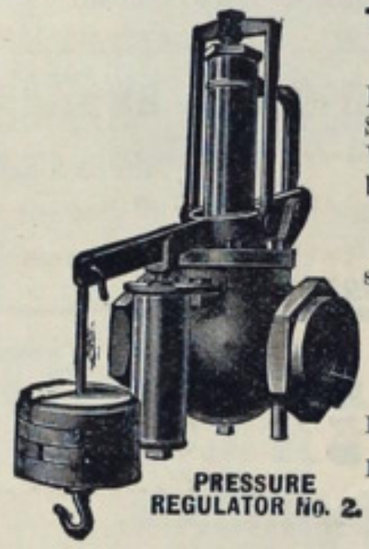

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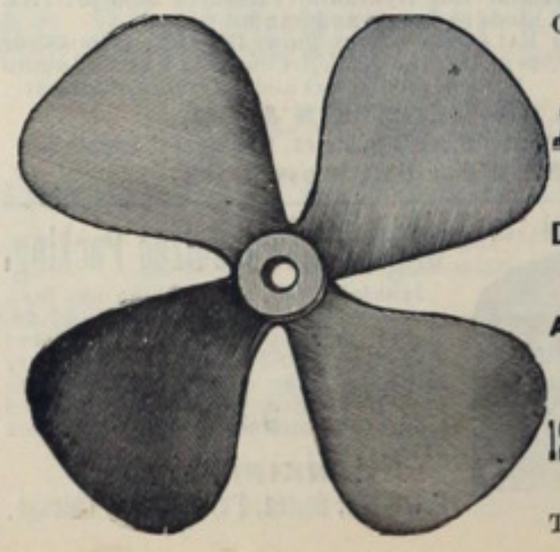

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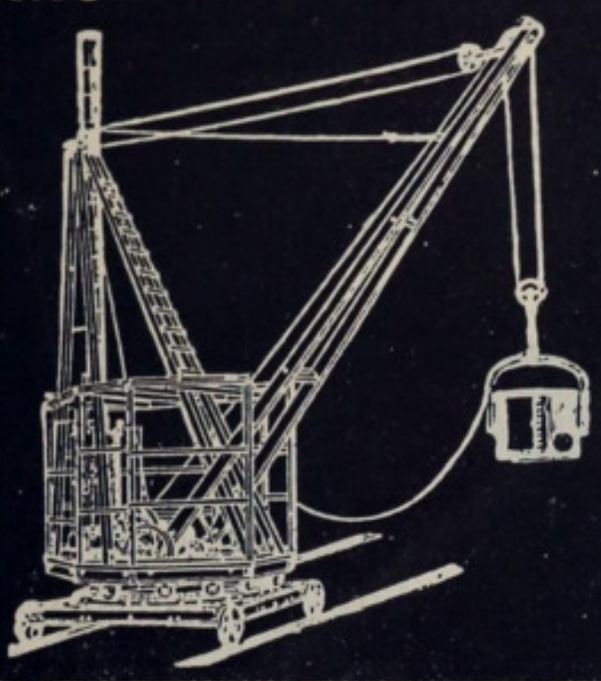

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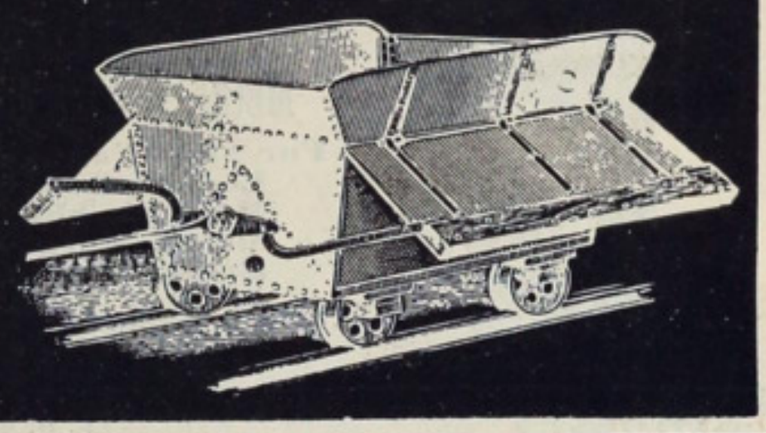

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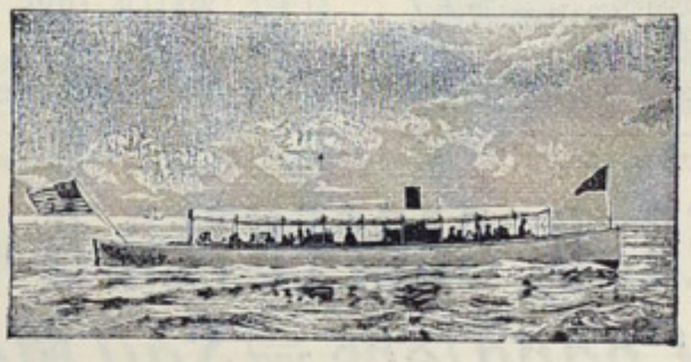

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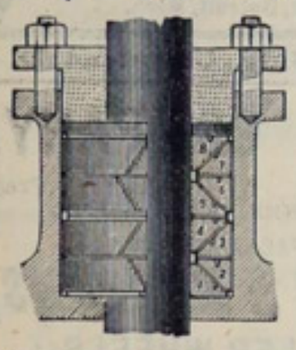

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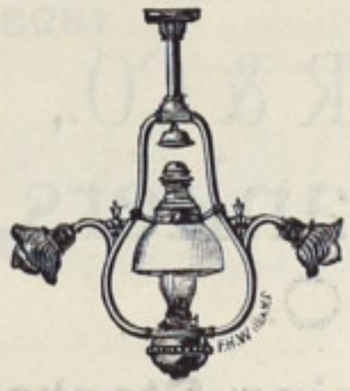

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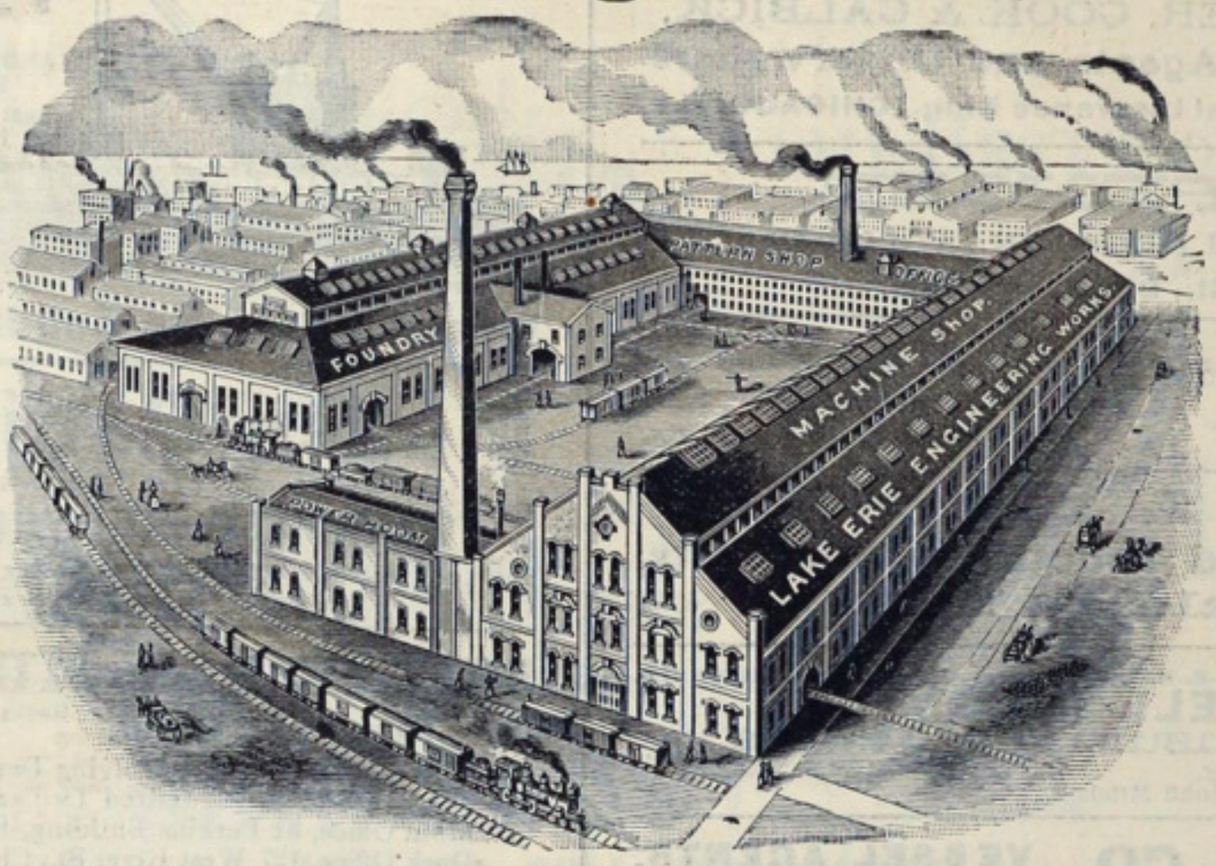

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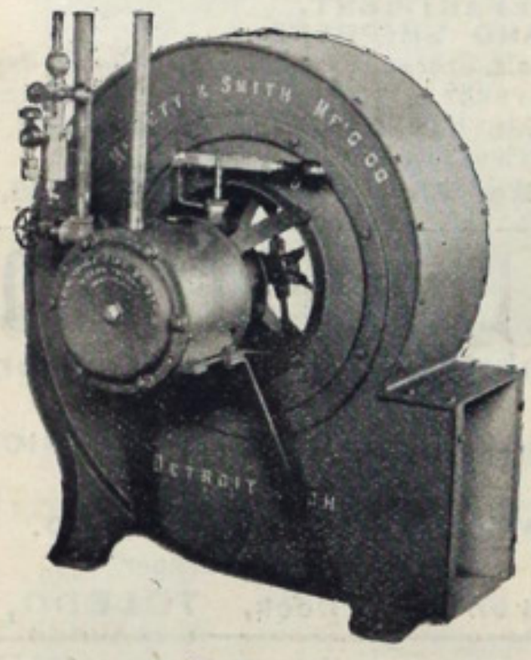

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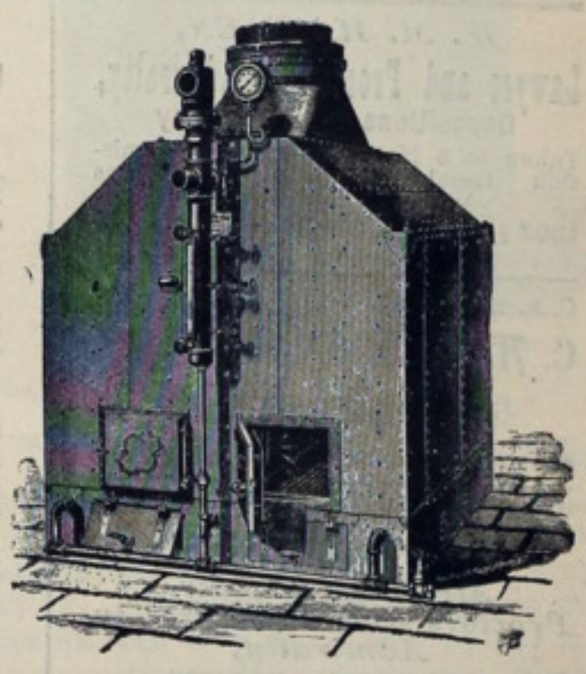

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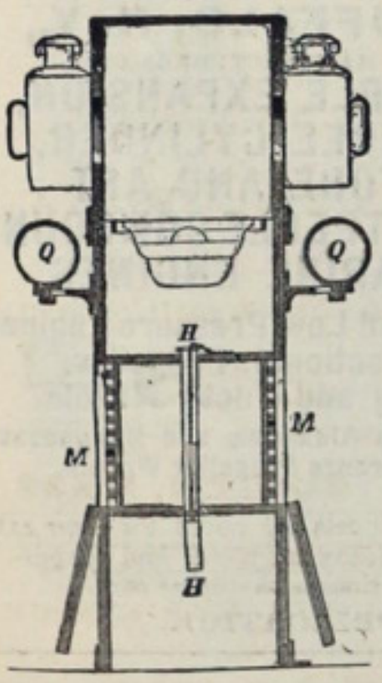

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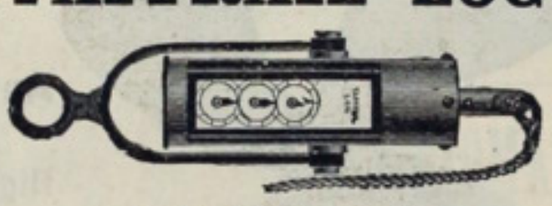

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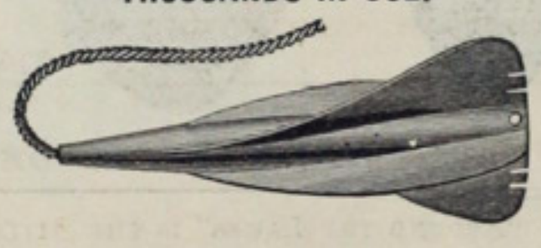

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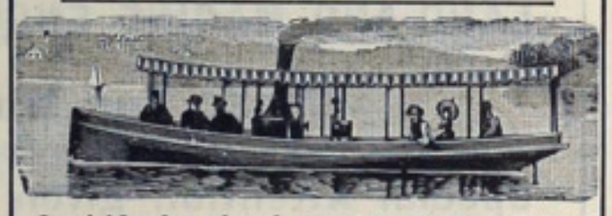

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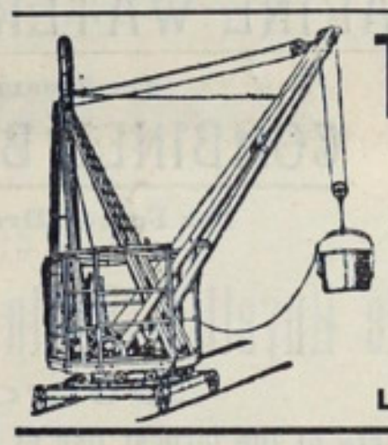

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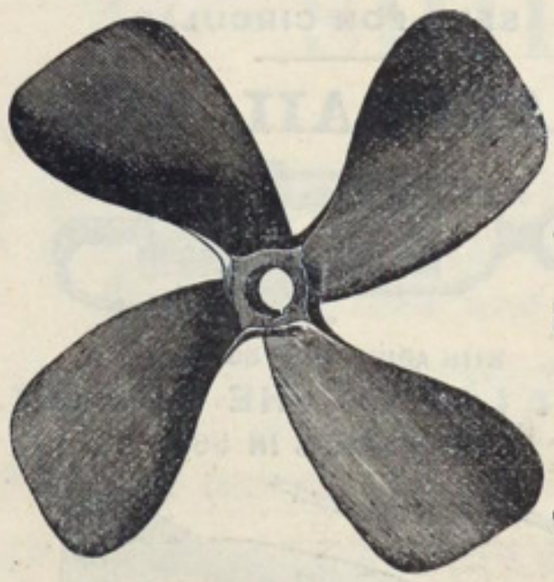

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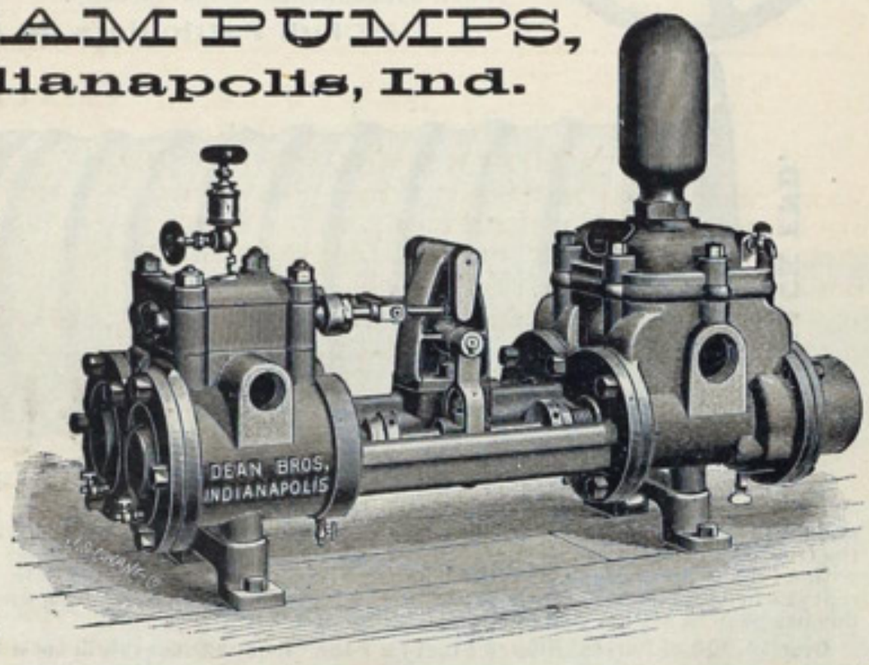

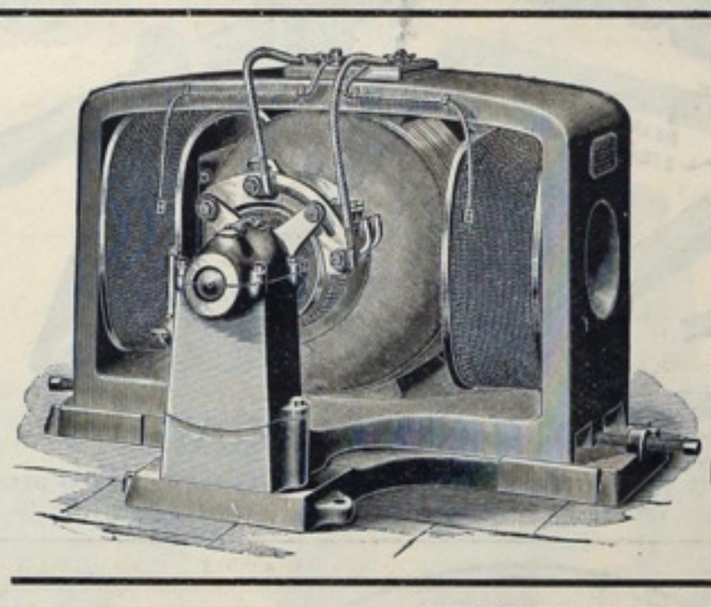

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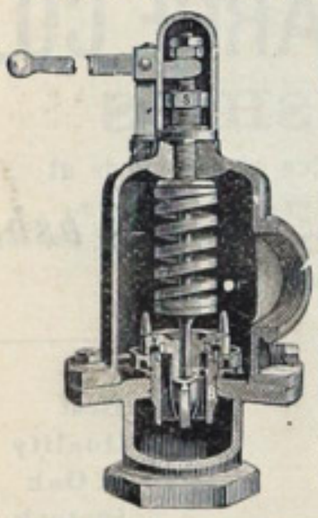

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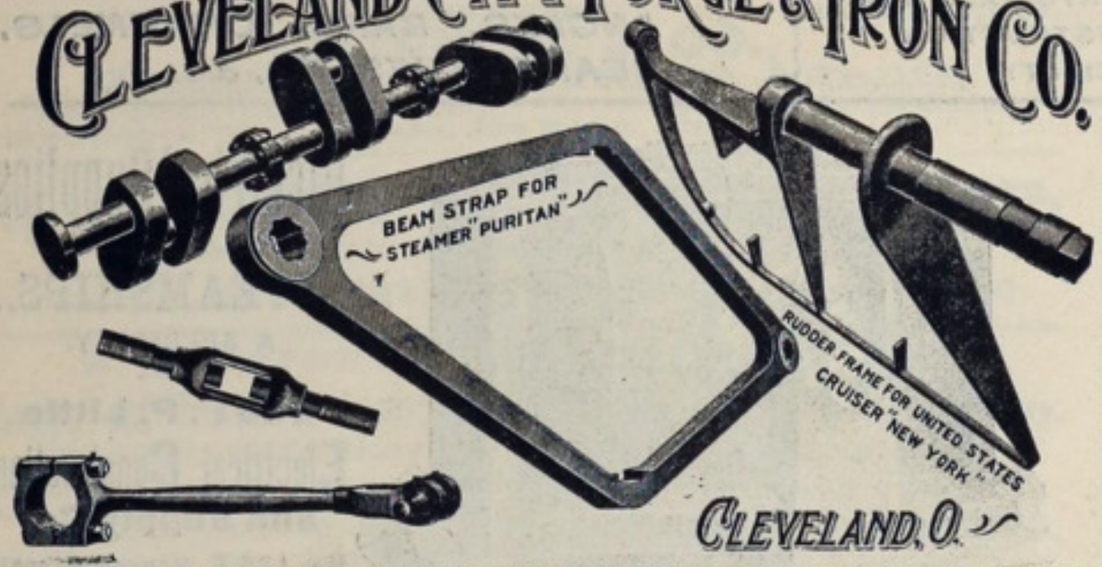

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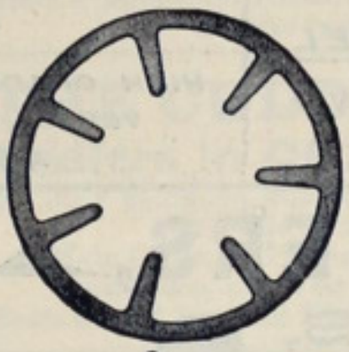

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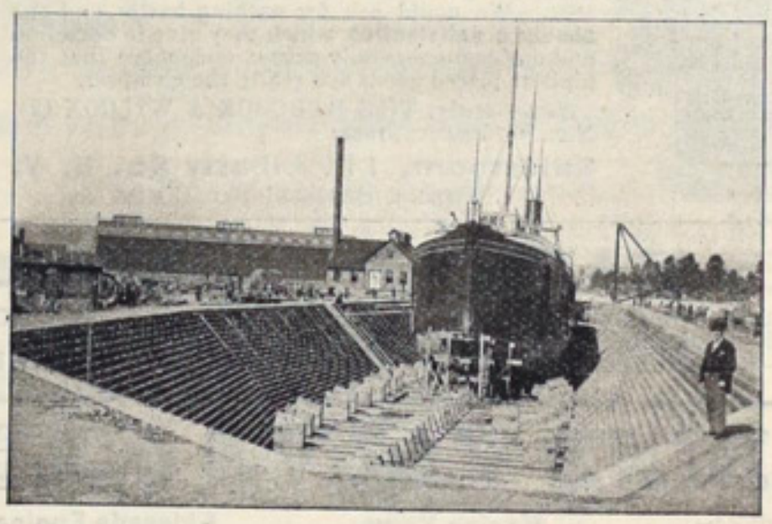

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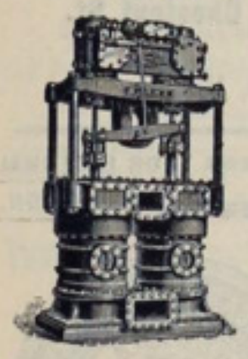

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